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EXAMINER

EINSMANN, JULIET CAROLINE

ART UNIT	PAPER NUMBER
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1655

DATE MAILED: 01/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/235,153

Applicant(s)

GEORGES ET AL.

Examiner

Juliet C Einsmann

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 34-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 34-42 and 44-66 is/are rejected.
- 7) ☒ Claim(s) 43 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is written in response applicant's correspondence submitted 11/7/01, paper number 16. Claims 1-33 have been canceled, and claims 34-68 have been added. Claims 34-68 are pending. Applicant's amendments and arguments have been thoroughly reviewed, but are not persuasive for the reasons that follow. Any rejections not reiterated in this action have been withdrawn. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action. **This action is FINAL.**

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 49-66 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 49-66 are indefinite over the recitation of "cruciferous" because the meaning of this phrase is unclear in light of the dependent claims. The ordinary practitioner would envision "cruciferous" plants as belonging to the plant family "Cruciferae," a family which includes many different genera of plants, including, for example plants of the genera Arabidopsis and Brassica. The dependent claims, however, require that the cruciferous plant or descendent thereof be from a variety of plant families and genera (see claims 61-63, for example), thus suggesting that "cruciferous" has some other meaning which is not clear. For these reasons, clarification of the claims is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 34-36, 39, 40-42, 44, 47, 48, 49, 50, 54, 55, 56, 58, 59, 60, 61, 62, 63, and 66 are rejected under 35 U.S.C. 102(b) as being anticipated by Murata (EP 0818138 A1).

Murata teaches a method of making a genetically transformed plant comprising:
selecting a nucleic acid sequence for its ability to encode a protein capable of modifying the utilization of a substrate in a secondary metabolic pathway;
transforming a plant cell with an expression cassette comprising said nucleic acid sequence;

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recovering a genetically altered plant from said plant cell, said genetically altered plant characterized by an altered nutritional profile relative to a wild-type of said plant (see Examples 8 (page 8) and 14 (page 10)).

The methods taught by Murata are specifically directed for the purpose of producing osmo-tolerant plants, however, these methods inherently meet the limitations of the instant claims. Murata specifically selects a gene encoding choline oxidase for plant transformation, selecting the choline oxidase for its ability to encode choline oxidase, a protein capable of modifying the utilization of a substrate in a secondary metabolic pathway. The transgenic plants recovered by Murata inherently have an altered nutritional profile by virtue of the fact that they are expressing choline oxidase. These plants would have lower lignin and sinapine content.

Murata further grows the plant obtained under conditions which permit the formation of a seed (page 10, line 10, for example). Murata teaches the plants and seeds produced by the plants obtained by this method (page 10, line 10-15), these seeds inherently have reduced lignin and sinapine content. Murata exemplifies the use of this method to produce transgenic *Arabidopsis thaliana*, of the family cruciferae, (example 8) and rice, *Oryza sativa*- family gramineaceae (example 10).

6. Claims 34-37, 39, 44, 47-48 rejected under 35 U.S.C. 102(e) as being anticipated by Cheng *et al.* (US 5948667).

Cheng *et al.* teach a method for altering the nutritional profile of a plant, comprising the steps of:

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selecting a nucleic acid sequence for its ability to encode a protein capable of modifying the utilization of a substrate in a secondary metabolic pathway associated with a nutritional profile in a plant;

transforming a plant cell with an expression cassette comprising said nucleic acid sequence;

recovering a genetically altered plant from said plant cell, said genetically altered plant characterized by an altered nutritional profile relative to a wild-type of said plant (Col. 17, line 56-Col. 19, line 25).

The methods taught by Cheng *et al.* comprise the transformation of *B. napus* with an expression vector comprising a seed specific promoter (the oleosin promoter) and a coding sequence for xylanase. The transformation of the plant with a coding sequence xylanase results in the production of transgenic plants with altered nutritional profiles because they contain a higher level of xylanase than wild type plants.

7. Claims 34-36, 39, 44, 46, 47, and 48 are rejected under 35 U.S.C. 102(b) as being anticipated by Chapple *et al.* (WO 97/23599), and claims 40, 48, 49-51, 54, 58, 59, 60, 61, 62, 63, 64, 65, and 66 are rejected under 35 U.S.C. 102(a) as being anticipated by Chapple *et al.* (WO 97/23599).

This application is a CIP of US 09/012453, now abandoned. The '453 application provides methods for modifying the phenolic compounds of plants by transforming the plants with genes that will act upon a product within the phenylpropanoid pathway. This disclosure is not sufficient to support the breadth of at least claims 34-36, 39, 44, 46, 47, and 48 since these claims encompass the use of any nucleic acid sequence which encodes a protein capable of

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modifying the utilization of a substrate in a secondary metabolic pathway associated with a nutritional profile of a plant, not only the phenylpropanoid pathway. Thus, Chapple *et al.* is a 102(b) reference against some claims and a 102(a) reference against other claims.

Chapple *et al.* teach a method for altering the nutritional profile of a plant, comprising the steps of:

selecting a nucleic acid sequence for its ability to encode a protein capable of modifying the utilization of a substrate in the phenylpropanoid pathway of said plant;

transforming a plant cell with an expression cassette comprising said nucleic acid sequence;

recovering a genetically altered plant from said plant cell, said genetically altered plant characterized by an altered nutritional profile relative to a wild-type of said plant (Example 5).

Chapple *et al.* teach the transformation of plants with the F5H gene in order to alter the lignin content in plants. Chapple *et al.* exemplify this method in the transformation of *Arabidopsis thaliana* (a crucifer) and further teach that this method is useful to transform other plants such as alfalfa, rice, maize and oil seed rape (Brassica) (p. 7, lines 15-20). Chapple *et al.* teach the growth of such plants to permit the formation of seed, and the recovery of said seed (p. 19, lines 4-5). Chapple *et al.* teach the use of tissue specific promoters (p. 15, lines 25-29). Chapple *et al.* teach method steps in which at least one genetically altered plant having altered lignin content is identified (p. 24 line 25-p. 24 line 7, Tables 1 and 2). Since the F5H gene effects the production of a product in the phenylpropanoid pathway which is necessary for the production of sinapine, (i.e. 5-hydroxyferulic acid) plants with decreased F5H activity as taught

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by Chapple *et al.* would inherently have the property of decreased sinapine levels compared to the wild type plants.

8. Claims 34, 35, 36, 39, 40, 46, 47, 48, 49, 50, 51, 54, 58, 59, 60, 61, 62, 63, 64, 65, and 66 are rejected under 35 U.S.C. 102(b) as being anticipated by Van Doorselaere *et al.* (WO 93/05160).

Van Doorselaere *et al.* teach a method for altering the nutritional profile of a plant, comprising the steps of:

selecting a nucleic acid sequence for its ability to encode a protein capable of modifying the utilization of a substrate in the phenylpropanoid pathway of said plant;

transforming a plant cell with an expression cassette comprising said nucleic acid sequence;

recovering a genetically altered plant from said plant cell, said genetically altered plant characterized by an altered nutritional profile relative to a wild-type of said plant (Example 4).

Van Doorselaere *et al.* teach the transformation of plants with a nucleic acid encoding O-methyl transferase (OMT) in order to alter the lignin content in plants. Van Doorselaere *et al.* exemplify this method in the transformation of poplar trees and further teach that this method is useful to transform other plants such as alfalfa, rice, maize and oil seed rape (Brassica) (p. 13, lines 15-26). Van Doorselaere *et al.* teach the use of tissue specific promoters (p. 12, lines 15-20). Van Doorselaere *et al.* teach method steps in which at least one genetically altered plant having altered lignin content is identified (p. 21 -23). Since the OMT gene effects the production of a product in the phenylpropanoid pathway which is necessary for the production of sinapine,

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(i.e. ferulic acid) plants with decreased OMT activity as taught by Van Doorselaere *et al.* would inherently have the property of decreased sinapine levels compared to the wild type plants.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 38 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murata in view of Willmitzer *et al.* (WO 92/01042).

Murata teaches a method of making a genetically transformed plant comprising: (a) introducing into a plant cell capable of being transformed and regenerated into a whole plant a DNA expression cassette comprising, in addition to DNA sequences required for transformation

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and selection in plant cells, a DNA sequence that, under the control of a promoter active in plant cells, encodes a heterologous enzyme capable of modifying the utilization of the substrate choline in the anti-nutritional phenylpropanoid pathway, and (b) recovering a plant which has an altered content of at least one product of the secondary metabolic pathway (see Examples 8 (page 8) and 14 (page 10)). Murata further grows the plant obtained under conditions which permit the formation of a seed (page 10, line 10, for example). Murata teaches the plants and seeds produced by the plants obtained by this method (page 10, line 10-15), these seeds inherently have reduced lignin and sinapine content. Murata exemplifies the use of this method to produce transgenic *Arabidopsis thaliana*, of the family cruciferae, (example 8) and rice, *Oryza sativa*- family gramineaceae (example 10). Murata further teaches that choline oxidase is an enzyme which is commercially available (p. 2, lines 55-56).

Murata does not teach methods in which the promoter is tissue selective, or specifically seed selective.

Willmitzer *et al.* teach transgenic plants expressing industrial enzymes, and methods for the production of such plants. The industrial enzymes suggested by Willmitzer *et al.* for use in these methods include oxidoreductases (p. 6, line 22). They teach that the DNA sequence encoding the enzyme of interest under the control of a promoter such as a seed specific promoter such as the phaseolin promoter (p. 4, lines 27-31). Willmitzer *et al.* teach a variety of plants useful for the introduction of the enzyme, including tobacco, potato, tomato, pea, soy, and cereals (p. 7, lines 19-21), and further teach that either the entire plant or parts thereof may be useful for animal feeds (p. 7, lines 10-13). Willmitzer *et al.* teach vectors for the integration of

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foreign DNA into plant cells and the introduction of these vectors into *Agrobacterium* species (p. 9, line 28-p. 9, line 19).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have used seed specific promoters for the expression of choline oxidase in plants as taught by Willmitzer *et al.* The ordinary practitioner would have been motivated to do so by the fact that choline oxidase is an enzyme which is sold commercially and because Willmitzer *et al.* expressly teach that the production of enzymes in plants overcomes two major obstacles in industrial enzyme production, "Firstly, higher plants have biosynthetic capacity to perform the requisite post-translational modifications occurring in eukaryotic cells of mammalian or other origin. Secondly, transgenic plants grown in the field need very little extra energy for growth (and hence for the production of proteins such as industrial enzymes) and furthermore do not give rise to any major problems with respect to waste management (p. 4, lines 10-18)." Furthermore, Murata provides the nucleic acid sequence encoding choline oxidase and demonstrates that it can be successfully expressed in transgenic plants. Willmitzer *et al.* provide the necessary suggestion and direction to motivate the production of choline oxidases in plants, and thus, in the absence secondary considerations such as unexpected results, the claimed invention is obvious over the prior art.

12. Claims 38 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chapple *et al.* (WO 97/23599) in view of both Kennley (WO 5662958) and Willmitzer *et al.* (WO 92/01042).

Chapple *et al.* teach a method for altering the nutritional profile of a plant, comprising the steps of:

selecting a nucleic acid sequence for its ability to encode a protein capable of modifying the utilization of a substrate in the phenylpropanoid pathway of said plant;

transforming a plant cell with an expression cassette comprising said nucleic acid sequence;

recovering a genetically altered plant from said plant cell, said genetically altered plant characterized by an altered nutritional profile relative to a wild-type of said plant (Example 5).

Chapple *et al.* teach the transformation of plants with the F5H gene in order to alter the lignin content in plants. Chapple *et al.* exemplify this method in the transformation of *Arabidopsis thaliana* (a crucifer) and further teach that this method is useful to transform other plants such as alfalfa, rice, maize and oil seed rape (Brassica) (p. 7, lines 15-20). Chapple *et al.* teach the growth of such plants to permit the formation of seed, and the recovery of said seed (p. 19, lines 4-5). Chapple *et al.* teach the use of tissue specific promoters (p. 15, lines 25-29). Chapple *et al.* teach method steps in which at least one genetically altered plant having altered lignin content is identified (p. 24 line 25-p. 24 line 7, Tables 1 and 2). Since the F5H gene effects the production of a product in the phenylpropanoid pathway which is necessary for the production of sinapine, (i.e. 5-hydroxyferulic acid) plants with decreased F5H activity as taught by Chapple *et al.* would inherently have the property of decreased sinapine levels compared to the wild type plants.

Chapple *et al.* do not teach methods in which a seed selective promoter is used to direct the expression of the nucleic acid sequence to seeds.

At the time the invention was made, it was routine to use the seeds of cruciferous plants as animal feed. Furthermore, it was widely known that the lignin content in such seeds is an

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anti-nutritional factor. For example, Kennley *et al.* teach that lignin within canola seed prevents extensive degradation of cellulose and hemicellulose by cellulolytic microorganisms (Col. 3, lines 30-40).

Willmitzer *et al.* provide methods for the transformation of plants with heterologous polypeptides, and specifically teach methodology for the direction of such heterologous polypeptides to the seeds of such plants. They teach that the DNA sequence encoding the enzyme of interest under the control of a promoter such as a seed specific promoter such as the phaseolin promoter (p. 4, lines 27-31).

Therefore, It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have used seed specific promoters such as those provided by Willmitzer *et al.* in the methods taught by Chapple *et al.* The ordinary practitioner would have been motivated to produce such plants in order to provide canola seed (*Brassica napus*) which has reduced lignin content, since Kennley *et al.* teach that "lignin within the canola seed coat prevent extensive degradation of cellulose and hemicellulose by cellulolytic microorganisms in the rumen or by the acidic environment of the abomasum and the small intestine. Some method of treatment is required to alter the seed to a form suitable for utilization by ruminants (Col. 3, lines 33-37)." Thus, in light of the teachings provided in the prior art, the instant invention is obvious to one of ordinary skill in the art at the time the invention was made.

13. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Doorselaere *et al.* in view of Chapple *et al.* (The Plant Cell, Vol. 4, 1413-1424).

Van Doorselaere *et al.* teach a method for altering the nutritional profile of a plant, comprising the steps of:

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selecting a nucleic acid sequence for its ability to encode a protein capable of modifying the utilization of a substrate in the phenylpropanoid pathway of said plant;

transforming a plant cell with an expression cassette comprising said nucleic acid sequence;

recovering a genetically altered plant from said plant cell, said genetically altered plant characterized by an altered nutritional profile relative to a wild-type of said plant (Example 4).

Van Doorsselaere *et al.* teach the transformation of plants with a nucleic acid encoding O-methyl transferase (OMT) in order to alter the lignin content in plants. Van Doorsselaere *et al.* exemplify this method in the transformation of poplar trees and further teach that this method is useful to transform other plants such as alfalfa, rice, maize and oil seed rape (Brassica) (p. 13, lines 15-26). Van Doorsselaere *et al.* teach the use of tissue specific promoters (p. 12, lines 15-20). Van Doorsselaere *et al.* teach method steps in which at least one genetically altered plant having altered lignin content is identified (p. 21 -23). Since the OMT gene effects the production of a product in the phenylpropanoid pathway which is necessary for the production of sinapine, (i.e. ferulic acid) plants with decreased OMT activity as taught by Van Doorsselaere *et al.* would inherently have the property of decreased sinapine levels compared to the wild type plants.

Van Doorsselaere *et al.* do not teach a method in which the transgenic plants are assayed for sinapine content.

Chapple *et al.* teach the scheme for the phenylpropanoid pathway (Figure 1). OMT is an enzyme which is necessary for the production of sinapoyl choline, in addition to being necessary for the production of lignin. Chapple *et al.* further teach methods for analysis of sinapine (sinapoyl choline) in seeds (p. 1421-1422). Chapple *et al.* teach that the presence of high levels

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of sinapine in canola seeds has a negative impact on the value of canola meal, and that it should also be possible to genetically eliminate sinapoyl choline from Brassica seeds without a deleterious effect on seedling growth.

Thus, in light of the transgenic plants provided by Van Doorselaere *et al.* and the teachings taught by Chapple *et al.*, It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have included an assay to detect a transgenic plant with reduced sinapine content in the methods taught by Van Doorselaere *et al.* The ordinary practitioner would have been motivated by the teachings of Chapple *et al.* that such a plant should be possible to produce by genetic modification and the fact that Van Doorselaere *et al.* provide transgenic plants that have a disruption in the pathway that leads to the production of sinapoyl choline. For these reasons, the claimed invention is considered *prima facie* obvious in view of the prior art.

RESPONSE TO REMARKS

Applicant argues that the Murata *et al.* reference should not apply to the amended claims for a number of reasons. Each of these reasons has been carefully considered but they are not persuasive. Applicant argues that Murata is concerned with osmotolerance and not nutritional profiles. This is true, however, the 102 rejection over Murata *et al.* is based on the fact that the methods of Murata *et al.* inherently meet the method steps of the instantly claimed invention, as discussed in the new rejection. The method steps taught by Murata *et al.* meet the limitations of the method steps in the instant invention. That Murata *et al.* intend their method for a different purpose is immaterial to the fact that their method anticipates the instantly claimed methods. A recitation of the intended use of the claimed invention must result in a structural difference

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between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. In the instant case, the method taught by Murata *et al.* is no different from the instantly claimed nucleic acid molecule (see MPEP 2111.02). Since it is the transformation of the plants with choline oxidase that causes the change in the nutritional profile of the plants, the plants produced using the methods taught by Murata *et al.* would inherently have an altered nutritional profile.

Applicant further argues that because Arabidopsis is essentially a weed the nutritional profile of this plant would not be changed. However, this is not persuasive. Whether or not one would use Arabidopsis as a feed is irrelevant to the issue of whether or not it would have a nutritional profile. The plant has certain biochemical characteristics which would make up such a profile, and therefore it has a nutritional profile. This profile would inherently be affected by the transformation of the plant with choline oxidase. Furthermore, Arabidopsis thaliana is certainly eaten by certain insects such as lepidopterans and locusts (see attached abstracts, for example). The fact that Arabidopsis is not commonly used as animal feed does not subtract from the fact that it would inherently have a nutritional profile that would be altered by the transformation of the plant with choline oxidase.

Applicant asserts that the fact that rice is not a crucifer means that the accumulation of anti-nutritional compounds is not a concern in rice. Arguments of counsel are not found to be persuasive in the absence of a factual showing. MPEP 716.01(c) makes clear that

“The arguments of counsel cannot take the place of evidence in the record. In re Schulze , 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). Examples of attorney statements

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which are not evidence and which must be supported by an appropriate affidavit or declaration include statements regarding unexpected results, commercial success, solution of a long - felt need, inoperability of the prior art, invention before the date of the reference, and allegations that the author(s) of the prior art derived the disclosed subject matter from the applicant.”

Furthermore, even though the level of anti-nutritional phenolics may not be as high in rice, certainly some phenolics are produced. The transformation of rice with choline oxidase, therefore would lead to a change in the nutritional profile of rice. Even if there were no phenolics in the rice, the transformation of the plant with choline oxidase would inherently change the nutritional profile of the plant by changing the amino acid composition of the plant upon the expression of the choline oxidase. Applicants also point out that with regard to the claims to product and compositions the claims are limited to cruciferous plants. However, as is noted above, this is indefinite in light of the dependent claims, which require that the cruciferous plant is, for example, from the family Gramineae, specifically being *Oryza*.

For each of these reasons, the rejection over Murata *et al.* is applied to the newly presented claims.

Applicant further argues that the rejection over Murata *et al.* in view of Willmitzer *et al.* should be withdrawn because there is no motivation to combine the two references and because the combination would be unworkable. However, this is not persuasive. In this rejection, Murata *et al.* is relied upon for their teaching of the methodology for the expression of choline oxidase in transgenic plants. Although Murata *et al.*'s purpose for completing such a method is different than the motivation provided in the rejection, nonetheless, Murata *et al.* provide a method for transforming plants with an industrial enzyme. Murata *et al.* specifically teach that choline oxidase is an industrial enzyme. The teachings of Willmitzer *et al.* provide an alternate

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use for the methods of Murata *et al.* and provide a motivation to modify the method for transforming plants with choline oxidase, as discussed in the rejection above. The transformation of plants with choline oxidase using a seed-specific promoter provides a new use for methods which utilize plants transformed with choline oxidase as taught by Murata *et al.* Thus, this rejection is also maintained.

New rejections have been added to address the amendments to the claims.

Allowable Subject Matter

14. Claims 43 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. Claim 57 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

16. While the prior art teaches methods for producing transgenic plants expressing heterologous choline oxidase (Murata, for example) and different transgenic plants expressing betaine aldehyde dehydrogenase (Holmström *et al.*, for example), the prior art does not teach or suggest methods in which both choline oxidase and betaine aldehyde dehydrogenase are introduced into the same plant under the control of a seed specific promoter.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

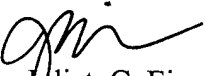
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juliet C. Einsmann whose telephone number is (703) 306-5824. The examiner can normally be reached on Monday through Thursday, 7:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, W. Gary Jones can be reached on (703) 308-1152. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 and (703) 305-3014.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.


JEFFREY FREDMAN
PRIMARY EXAMINER


Juliet C. Einsmann
Examiner
Art Unit 1655

January 14, 2002